Space Weather Forecast

Issued on Wednesday 29 January 2025 at 13:15 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated M-class flares. G1 minor geomagnetic storms likely 31 Jan with connection to faster solar winds.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate, with two lower Moderate flare in the last 24 hours.

There are currently five sunspot regions visible on the Earth-facing side of the Sun, with AR3967 and AR3975 fading from view. Many of these are located near the limbs, making detailed analysis challenging. AR3976, AR3977 and AR3978 are emerging from the north-eastern limb and represent the bulk of current activity and magnetic complexity, warranting further analysis as they move onto the solar disc. The remaining sunspots are small and magnetically simple.

No Earth-directed coronal mass ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind was at generally background levels, ranging from 300-360km/s with some weak CME influence likely. The Interplanetary Magnetic Field, Bt, was mostly weak, but peaked at moderate levels. The north-south component, Bz, mostly varied weakly. Geomagnetic activity was Quiet to briefly Active (Kp1-4).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected with a chance of isolated Moderate flares, and a very slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast, with the outlook dominated by a region of faster solar winds. This feature is expected to bring an increases of solar winds from current background levels towards elevated or strong levels, 550-650km/s, from later Day 2 (30 Jan) or more likely through Day 3 (31 Jan).

Generally Quiet activity (Kp1-2) expected initially. Activity expected to increase to become generally Unsettled to Active (Kp3-4) from late Day 2 (30 Jan) onwards, with the chance of G1 minor storm intervals increasing to a likelihood on Day 3 (31 Jan) with the expected connection to faster solar winds.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Energetic Particles / Solar Radiation: There is a slight chance of enhancements exceeding the S1/Minor Radiation Storm threshold at first, should any larger flares occur from over the western limb.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	1	20	60	40
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	40	40	40	40
Very Active	**R3-R5 (X Class)**	No	5	5	5	5

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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